**Template | Unit Enhancement**

***ENGINEERING DESIGN***

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**Background Information**

**Instructional Materials Title: Sound**

**Publication Date:**

**Work Group Participants: Lisa Boveng, Deb Spitzer, Jessica Thomashow, Julie Keller, Heather Christothoulou, Rebecca Lee, Paula Eisenrich**

**Date Developed: 8.22.2013**

**High Leverage Lesson (Title and Page Number): Lesson 15/16 pages 113-126 (Instructional Guide pages 49-51)**

**Rationale**

· **Why we identified this particular lesson**

**- Connections to NGSS… and WA Science Standards: 2-3SYSA, 2-3APPA. Engineering and Design Content: 3-5-ETS1-1, 2, 3**

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***Engineering* Lesson Enhancement**

**Overview**

· **Identification of where within the High Leverage Lesson to insert enhancement**

· **Key instructional strategies and tools needed**

**Part 1: Lesson Modifications to Lead Up to *Engineering Task***

Change the focus question: Demonstrate what you learned about sound by designing an instrument that produces three different pitches.

**Part 2: *Engineering* Learning Sequence**

Show students the available supplies that are available from the kit and sent in by families.

Establish constraints and criteria with the class. Post the lists

Students individually design instruments (sketch)

Students meet in pairs or groups to explain initial design and receive feedback for improvements.

Students write a reflection about instrument modification based on feedback from partner or group.

Students create instruments.

Students make a presentation and describe how their instruments make three different pitches and how it was optimized.

Optimize: improve instrument to meet original criteria or modify to meet a challenge task. For example: play song or make the instrument louder.

**Part 3-A: Engineering Task**

Students will design, create, and optimize an instrument that will produce three different pitches.

**Part 3-B: Assessment Rubric**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Elementary Engineering***  ***SOUND LESSON 15/16***  ***(Define/Design/Optimize)*** | | | | |
|  | *4* | *3* | *2* | *1* |
| ***Written explanation of optimizing throughout the design/building process*** | *Articulates more than three times when design was modified.* | *Articulates three times when design was modified.* | *Articulates two times when design was modified.* | *Articulates one or zero times when design was modified.* |
| ***Final instrument*** | *Designed an instrument that produced three different pitches. Optimized to meet challenge criteria.* | *Designed an instrument that produced three different pitches.* | *Designed an instrument that produced two pitches.* | *Designed an instrument that did not change pitch.* |
| ***Cooperative engineering*** | *Listened respectively during presentations and offered constructive feedback when appropriate. The feedback was scientifically based.* | *Listened respectively during presentations and offered constructive feedback when appropriate.* | *Listened respectively during presentations.* | *Did not participate during participation.* |

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**Additional Information**

NOTES

· Information that will be useful when teaching this lesson: Start collecting materials from families early.

- Resources that will be useful

- Scaffolds that students will use

Day 1-design & talk

Day 2-build

Day 3-present & evaluate

Day 4-optimize, present in small groups as time allows